CLAIMS

What is claimed is:

1. A method of forming a contact to an underlayer or region of a device comprising the steps of forming a contact hole, forming a contact hole barrier layer of a barrier material in the contact hole, etching the contact hole barrier layer on the bottom surface of the contact hole, depositing a liner material in the contact hole and filling the contact hole with a conductive material.

2. A method according to claim 1 in which the contact hole is formed extending through a portion of the device including a first barrier layer, the method including a wet etching step, the contact hole barrier layer being formed after the wet etching step and filling voids in the first barrier layer caused by the wet etching step.

3. A method according to claim 1 including a wet etching step, the contact hole barrier layer being formed before the wet etching step.

4. A method according to claim 2 in which, following the wet etching step, the contact hole barrier layer is thickened by application of a second contact hole barrier layer.

5. A method according to Claim 1, in which the barrier material is Al_2O_3 or TiO_2.

6. A method according to Claim 1, in which the barrier material is deposited using an atomic layer deposition (ALD) method.

7. A method according to Claim 1, in which the device is a semiconductor device.

8. A method according to Claim 1, in which the device is a passive device.

9. A method according to Claim 1, in which the device is a capacitor.

10. A method according to Claim 9, in which the device is an FeRAM.

11. A device including a contact to an underlayer of the device formed by forming a contact hole, forming a contact hole barrier layer of a barrier material in the contact hole, etching the contact hole barrier layer on the bottom surface of the contact hole, depositing a liner material in the contact hole and filling the contact hole with a conductive material.

12. A device according to Claim 11, in which the barrier material is Al_2O_3 or TiO_2.

13. A semiconductor device including a contact to an underlayer of the device formed by forming a contact hole, forming a contact hole barrier layer of a barrier material in the contact hole, etching the contact hole barrier layer on the bottom surface of the contact hole, depositing a liner material in the contact hole, and filling the contact hole with a conductive material.

14. A semiconductor device according to Claim 13, in which the barrier material is Al_2O_3 or TiO_2.

15. A capacitor including a contact to an underlayer of the device formed by forming a contact hole, forming a contact hole barrier layer of a barrier material in the contact hole, etching the contact hole barrier layer on the bottom surface of the contact hole, depositing a liner material in the contact hole and filling the contact hole with a conductive material.

16. A capacitor according to Claim 15, in which the barrier material is Al_2O_3 or TiO_2.

17. An FeRAM device including a contact to an underlayer of the device formed by forming a contact hole, forming a contact hole barrier layer of a

barrier material in the contact hole, etching the contact hole barrier layer on the bottom surface of the contact hole, depositing a liner material in the contact hole and filling the contact hole with a conductive material.

18. An FeRAM device according to Claim 17, in which the barrier material is Al_2O_3 or TiO_2.